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ABSTRACT

This paper discusses CEDEN's Parent-Child Program (PCP) and its external evaluation. The program promotes healthy child development among multi-problem, predominantly young families living at or below the poverty level in Austin, Texas. The goals of the PCP are to teach low-income parents in a culturally appropriate manner to encourage their children's development and provide stimulation, good nutrition, and health care for their children, and thereby prevent or reverse developmental delays. Objectives of the evaluation were to: (1) analyze short- and long-term program outcomes up to the first grade; (2) conduct a sociological study of the population served; and (3) study the process of program implementation. Information was gathered concerning sociodemographic characteristics of the family, the quality of the parent-child interaction, and the child's health, medical coverage, immunization status, developmental status, and nutritional status. Results of the evaluation showed that the PCP appears to have had a positive impact on children's hospitalization rates and mental development levels at the second birthday. However, there is as yet no evidence that either of these impacts continue past this time. (RJC)

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SELECTED CHILD DEVELOPMENT AND HEALTH CARE OUTCOMES OF THE CEDEN PARENT-CHILD PROGRAM: INTERIM REPORT

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I. INTRODUCTION

The CEDEN Family Resource Center for Development, Education and Nutrition is a private, non-profit human service organization in Austin, Texas, founded in 1979. Its mission is to strengthen low-income families through integrated educational and human service programs. CEDEN's leading program is the Parent-Child Program, or PCP. The main goal of this program is to promote healthy child development among multi-problem, predominantly young families living at or below the poverty level.

II. PROGRAM CHARACTERISTICS

A. Population Served

The PCP is a home-based, family-oriented program serving young children who meet any of the following criteria:

1) normal at birth, but living in home environments with two or more conditions considered to be high-risk factors leading to developmental delays;

2) assessed to have already developed mental or physical delays due to their home environment, or

3) at medical risk of delay due to prematurity or low birthweight.

Some of the risk factors identified in the Mexican-origin population served by the PCP in 1984 are: poverty, inadequate housing and crowdedness, lack of emotional support, lack of early infant stimulation

and related parenting skills, lack of access to and underutilization of essential health and human services, social isolation, low levels of formal education, substance abuse and family violence.

B. Program Goals

The primary goals of the PCP are: (1) to teach low-income parents in a culturally appropriate manner how to develop, stimulate and provide good nutrition and health care for their children, and thereby (2) to prevent or reverse developmental delays in their children.

C. Program Objectives

This talk will focus on a subset of program objectives relating to health care and child development. The objectives were to:

1) Prevent repeated major illnesses and accidents;
2) Improve and maintain adequate nutrition and appropriate health care, and
3) Improve children's mental or cognitive develomental level.

III. PROGRAM PROCESSES

A. Staff

During the criterion year of 1984-85, the program was staffed by the program coordinator, six home parent educators and two social work interns. The program coordinator carried out the overall supervisory and administrative tasks of the program. The home parent educators, who were primarily responsible for delivering the program, conducted home visits with the families of their caseload, assessed the children and

families, planned and conducted group meetings, and assisted program families in securing needed social and health services. The women filling this non-traditional job were all Mexican-Americans who were bilingual in Spanish and English, and were high school graduates. The social work interns primarily assisted with the provision of social services to the families of the program.

B. Service Components

1. Recruitment and Enrollment

Families with infants 0 to 18 months of age were recruited through door-to-door canvassing in low-income, primarily Hispanic neighborhoods in Austin. Home parent educators were assigned geographic sectors, and trained to conduct a preliminary screening of the family. Referrals were also received from health and human service agencies, hospitals and schools. Participation was entirely voluntary.

2. Assessment

After recruitment, the home parent educator administered the child development scales, interview protocols and structured observation forms to evaluate child developmental status, quality of the parent-child interaction and assess the risk factors for each infant, family and home environment.

3. Home Visits

After assessment, the home parent educators began a series of regular weekly visits to the caregiver and child, each to last approximately one hour. At least 24 home visits were to be made over the course of approximately 9 months. The home visit manual, evaluation

manual, infant stimulation curriculum, health and nutrition education packets, infant development book and toymaking book provided guidance, structure and activities for the home parent educator in planning and conducting the visits. Typical activities of each visit included working with both the infant and caregiver on infant stimulation, working with the caregiver on health and nutrition topics covered in the packets, addressing the needs of the child and family in the areas of social and health services and discussing the mother's concerns in the areas of child and family development. Home parent educators often dealt directly with children's or mothers' health problems, by encouraging or scheduling clinic visits, occasionally transporting participants to the clinic and encouraging timely immunizations. These activites served both to educate the parents concerning appropriate health care system use and to reduce the potential severity of illnesses.

4. Group Meetings

Group meetings for the participants were organized to reinforce program messages and provide opportunities for participants of the PCP to socialize and build support networks.

IV. EXTERNAL EVALUATION

In October, 1984, CEDEN began to conduct an external evaluation research project to study the PCP. This effort was funded under the Child Survival/Fair Start Initiative of the Ford Foundation.

A. Objectives

The objectives of the research project were to:

1) Analyze short- and longer-term program outcomes up to the first grade of elementary school;
2) Conduct a sociological study of the population served, and
3) Study the process of program implementation.

B. Design

The research project is designed as a quasi-experimental, longitudinal study, and has the following characteristics:

- The program (or treatment) group is composed of all the children and families served by the PCP, who completed the program in 1984-85.
- The comparison group is composed of a group of children and families who were matched as closely as possible on background socio-demographic characteristics, but who lived in communities surrounding Austin. They were ineligible to participate in the program by virtue of living outside of the service area. All the mothers in both groups identified themselves as being either Mexican-American or Mexican.
- Children are tested by research assistants trained exclusively for the purpose of conducting the research project. The research assistants do not participate in program service delivery; however, due to the families geographic location, the research assistants <u>are</u> aware of the group membership of the children and families being tested.
- Access to health care is similar between the two groups. All program families, and over 90% of the comparison group families

have both a city or county hospital and a publicly supported clinic in their communities.

- Testing was conducted near the time of program entry for the children and families of the program group, and at the equivalent ages of children in the comparison group. Follow-up tests are conducted at each birthday following entry, and are continuing at this time.
- The methods and instruments of the testing procedure include interview protocols for the mother, standardized tests, namely the Bayley Scales of Infant Development and the McCarthy Scales of Children's Abilities, the Caldwell and Bradley HOME, and a form to record height and weight measurements.

Information concerning socio-demographic characteristics of the family, the child's overall health, medical coverage and immunization status are gathered through the interviews with the mother. Children's developmental status is measured using the Bayley Scales of Infant Development at entry, first and second birthdays, and the McCarthy Scales of Children's Abilities at the third and fourth birthdays. Quality of the parent-child interaction is measured via the Caldwell HOME, and the child is weighed and measured for height in order to assess nutritional status.

V. EVALUATION OUTCOMES

Evaluation outcomes are presented in tables one through seven. Information on the two groups' socio-demographic characteristics will be presented for the time of entry, along with childrens' birthweights.

Outcome measures concerning children's weights, health status, use of the health care system and mental/cognitive developmental level will be presented for tests at entry, and at the 2nd, 3rd and 4th birthdays. Most entry tests occurred prior to the intervention, while most second birthday tests occurred after the intervention for the program children.

Table 1 presents those socio-demographic characteristics measured as continuous variables. With respect to the child:

- **Age at the time of the entry test did not differ significantly between groups.**

With respect to the mother-child interaction;

- **The quality of the parent-child interaction as measured by the Involvement subscale of the Caldwell HOME differed significantly between groups, with the program group showing a lower mean score.**

With respect to the mother;

- **Mean age of the mothers did not differ significantly between the two groups, however**
- **The mean number of years of formal education was significantly different, with program group mothers having an average of 1.2 fewer years of education.**

TABLE 1

Demographic Characteristics of the Program and Comparison Groups, Measured at Entry

Variable	Group Means: Program	Group Means: Comparison	t	P-Value	
CHILD	(N = 93)	(N = 153)			
Age at Entry (Months)	8.4	7.8	-.76	.45	
MOTHER-CHILD INTERACTION					
Caldwell HOME Involvement Score	2.8	3.4	2.56	.01	*
MOTHER	(N = 82)	(N = 137)			
Age	23.8	24.2	-.51	.61	
Education (Years)	8.4	9.6	2.63	.006	**
No. Times Moved, Last 3 Years	1.5	1.6	.50	.62	
FAMILY	(N = 82)	(N = 137)			
Per Capita Income (Dollars/Week)	44	39	-1.32	.19	
Per Capita Income Net of Rent (Dollars/Week)	33	32	-.37	.71	
Crowdedness (Persons/Room)	1.4	1.3	-.66	.51	

- **Mobility, as measured by the number of times moved in the last three years also did not differ between groups.**

With respect to the family;

- **Per-capita income, per-capita income net of rent and crowdedness were all similar between groups.**

Table 2 presents socio-demographic characteristics measured as discrete variables. With respect to the child;

- **The percent of children who were primiparous was nearly equal in the two groups, and**
- **The percent having alternate caregivers was also nearly equal.**

With respect to the mother;

- **Significantly fewer of the program group mothers were U.S.-born. (Those not born in the U.S. were born in Mexico).**
- **Approximately three-fourths of the mothers in each group lived with a husband or male companion.**

TABLE 2

Demographic Characteristics of the Program and Comparison Groups, Measured at Entry

Variable	Percent:	Program	Comparison	χ^2	P-Value
CHILD		(N = 93)	(N = 153)		
Parity	Primiparous	31 %	30 %	.00	.95
Alternate Caregivers	Has One or More Altern. Caregivers	49	43	.74	.39
MOTHER		(N = 82)	(N = 137)		
Country of Origin	U.S.-Born	72 %	84 %	4.17	.04 *
Cohabiting Status	Lives w/ Spouse or Companion	76	71	.52	.47
FAMILY		(N = 82)	(N = 137)		
Employment	Has Income from Employment	91 %	83 %	2.96	.09
Occupation of Main Income Earner	Unskilled or Semi-skilled Occupation	53	50	.20	.91
AFDC	Receives AFDC	13	16	.28	.60
Food Stamps	Receives Food Stamps	22	30	1.66	.20
Subsidized Housing	Lives in Subsidized Housing	6	18	5.82	.02 *
Telephone	Has a Phone	51	51	.00	.99
Condition of House	Floor and Walls in Good Condition	89	85	.59	.44

With respect to the family;

- **The percent of families with income from employment, and**
- **The percent of main income earners with unskilled or semi-skilled occupations were similar between the two groups.**
- **The percent of families receiving AFDC, and**
- **The percent receiving foodstamps were similar.**
- **However, the percent living in subsidized housing differed between the two groups, with significantly more of the comparison group living in subsidized housing.**
- **Finally, similar percentages of families had a telephone, and**
- **Had housing which was in good condition.**

Table 3 presents information regarding birthweight and perinatal problems.

- **Program children had a significantly lower mean birthweight**
- **More than twice as many of the program children were low birthweight.**
- **Nearly twice as many of the program children's birthweights wereless than 10th percentile, a significant difference.**

TABLE 3

Mean and Percentile Distribution of Birth Weight, and Frequency of Perinatal Problems, Program vs. Comparison Groups [1]

Variable	Group Means: Program (N = 93)	Group Means: Comparison (N = 150)	t	P-Value	
BIRTH WEIGHT(Lbs.)	7.0	7.4	2.35	.02	*

Variable	Group Percents: Program	Group Percents: Comparison	χ^2	P-Value	
PERCENT LOW BIRTHWEIGHT (< 5.5 POUNDS) [2]	10.9 %	4.7 %	3.30	.07	
PERCENT LESS THAN THAN 10TH %ILE IN BIRTHWEIGHT	18.3	9.3	4.13	.04	*
PERCENT PREMATURE	9.8	8.7	0.08	.78	
PERCENT HAVING PERINATAL PROBLEMS [3]	19.4	16.6	0.31	.58	

1. Mother's report, for both birthweight and perinatal problems.
2. One child in the program group was very low birthweight (VLBW), weighing 2.75 pounds at birth (mother's report).
3. Reported problems included jaundice, oxygen deficiency, other respiratory problems, and high bilirubin count.

- **Similar percentages of children in both groups were born prematurely, about nine to ten percent.**
- **The two groups were similar in the percent of children having perinatal problems requiring medical attention, between 17 and 19 percent.**

Table 4 presents results for children's mean weight, the percent less than 10th %ile, and the percent greater than 90th percentile.

- **Mean weights at entry, and 2nd through 4th birthdays were compared through analysis of covariance, controlling for age at time of measurement. Although differences are not significant at any one time, the mean program group weight becomes more similar to mean comparison group weight over time (the program group actually weighed nearly half-a-pound less than the comparison group at entry, when controlled for age).**
- **The program group has a somewhat greater percentage of children whose weight is less than 10th percentile at each age, although none of the comparisons are significant. Percentile classifications have not yet been made for 4th birthday weights.**
- **The program group shows a somewhat greater decline over time than does the comparison group in**

TABLE 4

Mean Weights and Percentile Distributions,at Entry and Subsequent Testing Points, Program vs. Comparison Group Children

		PRE-TEST	POST-TESTS		
	Group	Entry [1]	2nd BD	3rd BD	4th BD [2]
N	Program	92	78	71	55
	Comparison	150	121	110	48
MEAN WEIGHT (LBS.)	Program	17.9	27.4	31.0	36.3
	Comparison	17.8	27.7	31.4	35.8
P Value [3]		.22	.52	.42	.72
PERCENT LESS THAN 10TH %ILE	Program	8.7 %	9.1 %	15.5 %	-
	Comparison	6.0	5.8	10.1	-
P Value [4]		.45	.40	.35	
PERCENT GREATER THAN 90TH %ILE	Program	22.8	15.6	8.5	-
	Comparison	20.0	17.4	14.7	-
P Value [4]		.63	.85	.25	

1. Mean ages at entry were 8.4 mos. for the program group and 7.8 mos. for the comparison group, t = -.76, P = .45.
2. Children who are reaching their fourth birthdays are continuing to be tested.
3. T-test comparing least squares means resulting from analysis of covariance, controlling for age when weight was measured.
4. Fisher's Exact Test, 2-tailed.

the percentage of children whose weight is greater than 90th percentile. Although none of the comparisons are significant at any one time, further analysis of this data is required to determine whether the contrast between groups in their change over time is significant.

Table 5 presents information regarding health care system use and health status.

- **To measure the percent of children having regular or "well-baby" check-ups, mothers were asked, 'Do you take your child to the doctor even when he/she is not sick?' The program group responded 'yes' significantly more often at each measurement point than did the comparison group.**
- **There was no significant difference between groups in the percent having medical coverage of some type for the child. Both groups show a marked decline in rate of coverage over time.**
- **The program group, living in an inner city setting, tends to have a higher rate than the comparison group of accidents requiring a doctor's attention, although not significantly so. However, both groups showed a rise in frequency of accidents over time, presumably due to maturation.**
- **Finally, the program appears to have had a direct impact on the percentage of children hospitalized**

TABLE 5

Use of Health Care System, and Accident and Morbidity Rates, Program vs. Comparison Groups

		PRE-TEST	POST-TESTS		
	Group	Entry [1]	2nd BD	3rd BD	4th BD [2]
N	Program	92	81	72	55
	Comparison	150	125	110	42
PERCENT HAVING REGULAR CHECKUPS [1]	Program	74%	51%	58%	30%
	Comparison	56	33	23	7
P Value [2]		.01	.01	.00	.01
PERCENT HAVING COVERAGE	Program	62	50	44	35
	Comparison	58	45	42	36
P Value [2]		.53	.46	.79	.91
PERCENT HAVING ACCIDENT	Program	2.2	12.4	12.5	12.7
	Comparison	4.0	9.6	8.2	2.4
P Value [3]		.71	.65	.45	.13
PERCENT HOSPITALIZED DUE TO ILLNESS	Program	18.5	2.5	4.2	7.4
	Comparison	9.9	8.0	4.6	2.4
P Value [3]		.08	.13	1.00	.38

1. Mother responded 'yes' to question, "Do you take your child to the doctor even if he/she is not sick?"
2. Chi-Square.
3. Fisher's Exact Test, 2-Tailed.

TABLE 6

Mean Scores on Bayley Scales of Infant Development and McCarthy Scales of Children's Abilities, Program vs. Comparison Groups.

		PRE-TEST	POST-TESTS		
	Group	Entry	2nd BD	3rd BD	4th BD [1]
NUMBER OF TESTING VISITS	Program	93	81	73	58
	Comparison	152	130	110	48
		Bayley MDI [2]	Bayley MDI	McCarthy GCI	McCarthy GCI
NUMBER OF VALID TESTS [3]	Program	54	64	60	49
	Comparison	97	124	102	41
MEAN MDI OR GCI SCORE	Program	105.3	93.8	88.7	91.4
	Comparison	102.2	93.3	90.7	89.8
P VALUE (t-test)		.24	.83	.24	.53

1. Testing is continuing on children who are reaching their fourth birthdays.
2. The MDI is the Bayley Scales of Infant Development (BSID) Mental Development Index score, and the GCI is the McCarthy Scales of Children's Abilities (MSCA) General Cognitive Index score. The BSID was administered at entry and at the second birthday, while the MSCA was administered at the third and fourth birthdays.
3. Children ranged in age from 0 to 20 months at entry. A total of 34 (12.6%) of the 269 tests administered to program children, and 26 (6.7%) of the 388 administered to comparison group children were invalid, and excluded from the analysis. Eight program children were tested on their second birthdays before the program ended, and these tests are excluded from this analysis.

due to illness, changing from twice as high at entry, to much lower after intervention. Repeated measures analysis of variance demonstrates that the contrast between program and comparison groups in the change between entry and 2nd birthday is significant (for interaction of group and time, $F(1,202) = 6.21$, $P = .0135$).

Table 6 presents results concerning childrens' mental/cognitive developmental level,.as measured by the Bayley Scale Mental Development Index (MDI) or the McCarthy Scale General Cognitive Index (GCI).

- **Entry scores were obtained for 54 of the program group children and 97 of the comparison group children who were 6 months old or older at the time of the test. Mean scores at entry were not significantly different between groups, nor were there any significant differences between groups at the 2nd, 3rd or 4th birthday followups.**

Table 7 presents the results of analyses of covariance on Bayley MDI and McCarthy GCI scores.

- **Analyses of covariance were performed on 2nd birthday Bayley MDI scores and 3rd and 4th birthday McCarthy GCI scores, taking into account the above-mentioned, pre-existing intergroup differences in mother's education, birthweight and the Caldwell**

TABLE 7

Analysis of Covariance of BSID MDI Scores and MSCA GCI Scores, Taking into Account Mother's Education, Birthweight and Caldwell HOME Involvement Subscale Scores

		2nd BD Bayley MDI	3rd BD McCarthy GCI	4th BD [1] McCarthy GCI
NUMBER OF TESTS	Program	63	59	48
	Comparison	121	101	39
ADJUSTED MEAN MDI OR GCI SCORE [2]	Program	96.9	89.6	92.7
	Comparison	93.1	90.2	90.0
P VALUE (t-test)		.099	.720	.264

1. Testing is continuing on children who are reaching their fourth birthdays.
2. Means are the least squares means, which are those which would be expected if the two groups were to have equal mean scores on the covariates.

HOME Involvement subscale score. All three of these variables are significantly different between groups, all differences favor the comparison group and all are significantly, positively related to Bayley MDI or McCarthy GCI scores. The comparison, at the second birthday, of the least squares mean MDI scores (the mean scores adjusted for the influence of the covariates) showed a non-significant trend toward a difference between groups favoring the program group by 3.8 points (P = .099). Comparisons for the third and fourth birthday GCI scores do not show this trend.

IV. CONCLUSION

To date, the results of this evaluation show that the Parent-Child Program appears to have had a positive impact on children's hospitalization rates at the second birthday, and on children's mental development levels at the second birthday, a time which closely followed the intervention. However, in both cases there is no evidence as yet that these impacts continue past this time. This pattern of results argues for the importance of a concerted program follow-up component, to maintain the gains produced by the intervention. The PCP is currently in the process of implementing such a follow-up component.